SEQUENCE LISTING

<110> Brown, Arthur M.
Wible, Barbara A
Yang, Qing

<120> Protein That Enhances Expression of Potassium Channels on Cell Surfaces and Nucleic Acids That Encode The Same

<130> 22884/04066

<150> 09/062,440
<151> 1998-04-17

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<151> 2000-11-14

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<170> PatentIn version 3.1

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Val Gly Ser Pro Ser Pro Leu Ala Ser Ile Pro Pro Thr Leu Leu Thr
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cct ggc acc ttg ctg ggc cct aag cgt gag gtg gac atg cac cct cct      192
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Asn Gly Ala Glu Pro Lys Arg Pro Ser Arg Pro Ile Asn Ile Thr Pro
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ctg gct cgt ctc tca gcc act gtt ccc aac acc ata gtg gtt aac tgg      624
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tat gag tca ctg att att gat ggt tta ttc atg gaa att ctt aat tcc     1008
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Pro Met Lys Pro Lys Lys Glu Ala Ser Glu Val Cys Pro Pro Pro Gly
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Ser Glu Asn Lys Lys Arg Val Glu Val Ile Asp Leu Thr Ile Glu Ser
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Ser Ser Asp Glu Glu Asp Leu Pro Pro Thr Lys Lys His Cys Pro Val
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Thr Ser Ala Ala Ile Pro Ala Leu Pro Gly Ser Lys Gly Ala Leu Thr
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Leu Gly Ser Asp Phe Leu Ser Ser Leu Pro Leu His Glu Tyr Pro Pro
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Ala Phe Pro Leu Gly Ala Asp Ile Gln Gly Leu Asp Leu Phe Ser Phe
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Asp Glu Gln Asp Thr Leu Gly His Phe Phe Gln Phe Arg Gly Thr Pro
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ggg ccc tct gat ctc tcc ctt ctc tct ttg ccc cct ggc acc tct cct       96
Gly Pro Ser Asp Leu Ser Leu Leu Ser Leu Pro Pro Gly Thr Ser Pro
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gta ggc tcc cct ggt cct cta gct ccc att ccc cca acg ctg ttg gcc      144
Val Gly Ser Pro Gly Pro Leu Ala Pro Ile Pro Pro Thr Leu Leu Ala
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cct ggc acc ctg ctg ggc ccc aag cgt gag gtg gac atg cac ccc cct      192
Pro Gly Thr Leu Leu Gly Pro Lys Arg Glu Val Asp Met His Pro Pro
    50                  55                  60

ctg ccc cag cct gtg cac cct gat gtc acc atg aaa cca ttg ccc ttc      240
Leu Pro Gln Pro Val His Pro Asp Val Thr Met Lys Pro Leu Pro Phe
65                  70                  75                  80

tat gaa gtc tat ggg gag ctc atc cgg ccc acc acc ctt gca tcc act      288
Tyr Glu Val Tyr Gly Glu Leu Ile Arg Pro Thr Thr Leu Ala Ser Thr
                85                  90                  95

tct agc cag cgg ttt gag gaa gcg cac ttt acc ttt gcc ctc aca ccc      336
Ser Ser Gln Arg Phe Glu Glu Ala His Phe Thr Phe Ala Leu Thr Pro
            100                 105                 110

cag caa gtg cag cag att ctt aca tcc aga gag gtt ctg cca gga gcc      384
Gln Gln Val Gln Gln Ile Leu Thr Ser Arg Glu Val Leu Pro Gly Ala
        115                 120                 125

aaa tgt gat tat acc ata cag gtg cag cta agg ttc tgt ctc tgt gag      432
Lys Cys Asp Tyr Thr Ile Gln Val Gln Leu Arg Phe Cys Leu Cys Glu
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acc agc tgc ccc cag gaa gat tat ttt ccc ccc aac ctc ttt gtc aag      480
Thr Ser Cys Pro Gln Glu Asp Tyr Phe Pro Pro Asn Leu Phe Val Lys
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gtt aat ggg aaa ctg tgc ccc ctg ccg ggt tac ctt ccc cca acc aag      528
Val Asn Gly Lys Leu Cys Pro Leu Pro Gly Tyr Leu Pro Pro Thr Lys
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aat ggg gcc gag ccc aag agg ccc agc cgc ccc atc aac atc aca ccc      576
Asn Gly Ala Glu Pro Lys Arg Pro Ser Arg Pro Ile Asn Ile Thr Pro
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ctg gct cga ctc tca gcc act gtt ccc aac acc att gtg gtc aat tgg      624
Leu Ala Arg Leu Ser Ala Thr Val Pro Asn Thr Ile Val Val Asn Trp
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tca tct gag ttc gga cgg aat tac tcc ttg tct gtg tac ctg gtg agg      672
Ser Ser Glu Phe Gly Arg Asn Tyr Ser Leu Ser Val Tyr Leu Val Arg
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cag ttg act gca gga acc ctt cta caa aaa ctc aga gca aag ggt atc      720
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225                 230                 235                 240

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Arg Asn Pro Asp His Ser Arg Ala Leu Ile Lys Glu Lys Leu Thr Ala
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gac cct gac agt gag gtg gcc act aca agt ctc cgg gtg tca ctc atg      816
Asp Pro Asp Ser Glu Val Ala Thr Thr Ser Leu Arg Val Ser Leu Met
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gag aag aag cct aca tgg aca tgt cct gtg tgt gac aag aag gct ccc      960
Glu Lys Lys Pro Thr Trp Thr Cys Pro Val Cys Asp Lys Lys Ala Pro
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cca atg aaa ccc aag aag gag gca tct gag gtt tgc ccc ccg cca ggg     1104
Pro Met Lys Pro Lys Lys Glu Ala Ser Glu Val Cys Pro Pro Pro Gly
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tat ggg ctg gat ggc ctc cag tac agc cca gtc cag ggg gga gat cca     1152
Tyr Gly Leu Asp Gly Leu Gln Tyr Ser Pro Val Gln Gly Gly Asp Pro
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tca gag aat aag aag aag gtc gaa gtt att gac ttg aca ata gaa agc     1200
Ser Glu Asn Lys Lys Lys Val Glu Val Ile Asp Leu Thr Ile Glu Ser
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gat gaa cag gat gcc ctt ggc cac ttc ttc cag tac cga ggg acc cct 1536
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500 505 510

tct cac ttt ctg ggc cca ctg gcc ccc acg ctg ggg agc tcc cac tgc 1584
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530 535 540

cct ggg ggg gcc ttg agg gag ggg cat gga gga ccc ctg ccc tca ggt 1680
Pro Gly Gly Ala Leu Arg Glu Gly His Gly Gly Pro Leu Pro Ser Gly
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Leu Pro Gln Pro Val His Pro Asp Val Thr Met Lys Pro Leu Pro Phe
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Lys Cys Asp Tyr Thr Ile Gln Val Gln Leu Arg Phe Cys Leu Cys Glu
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Thr Ser Cys Pro Gln Glu Asp Tyr Phe Pro Pro Asn Leu Phe Val Lys
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Val Asn Gly Lys Leu Cys Pro Leu Pro Gly Tyr Leu Pro Pro Thr Lys
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180 185 190

Leu Ala Arg Leu Ser Ala Thr Val Pro Asn Thr Ile Val Val Asn Trp
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Pro Met Lys Pro Lys Lys Glu Ala Ser Glu Val Cys Pro Pro Pro Gly
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Tyr Gly Leu Asp Gly Leu Gln Tyr Ser Pro Val Gln Gly Gly Asp Pro
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Ser Glu Asn Lys Lys Lys Val Glu Val Ile Asp Leu Thr Ile Glu Ser
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Ser Ser Asp Glu Glu Asp Leu Pro Pro Thr Lys Lys His Cys Ser Val
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Thr Ser Ala Ala Ile Pro Ala Leu Pro Gly Ser Lys Gly Val Leu Thr
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Ser Gly His Gln Pro Ser Ser Val Leu Arg Ser Pro Ala Met Gly Thr
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Leu Gly Gly Asp Phe Leu Ser Ser Leu Pro Leu His Glu Tyr Pro Pro
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Ser His Phe Leu Gly Pro Leu Ala Pro Thr Leu Gly Ser Ser His Cys
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Met Lys Ile Lys Glu Leu Tyr Arg Arg Arg Phe Pro Arg Lys Thr Leu
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Gly Pro Ser Asp Leu Ser Leu Leu Ser Leu Pro Pro Gly Thr Ser Pro
            20                  25                  30

Val Gly Ser Pro Xaa Pro Leu Ala Xaa Ile Pro Pro Thr Leu Leu Xaa
        35                  40                  45

Pro Gly Thr Leu Leu Gly Pro Lys Arg Glu Val Asp Met His Pro Pro
    50                  55                  60
```

```
Leu Pro Gln Pro Val His Pro Asp Val Thr Met Lys Pro Leu Pro Phe
65                  70                  75                  80

Tyr Glu Val Tyr Gly Glu Leu Ile Arg Pro Thr Thr Leu Ala Ser Thr
                85                  90                  95

Ser Ser Gln Arg Phe Glu Glu Ala His Phe Thr Phe Ala Leu Thr Pro
            100                 105                 110

Gln Gln Xaa Gln Gln Ile Leu Thr Ser Arg Glu Val Leu Pro Gly Ala
        115                 120                 125

Lys Cys Asp Tyr Thr Ile Gln Val Gln Leu Arg Phe Cys Leu Cys Glu
    130                 135                 140

Thr Ser Cys Pro Gln Glu Asp Tyr Phe Pro Pro Asn Leu Phe Val Lys
145                 150                 155                 160

Val Asn Gly Lys Leu Cys Pro Leu Pro Gly Tyr Leu Pro Pro Thr Lys
                165                 170                 175

Asn Gly Ala Glu Pro Lys Arg Pro Ser Arg Pro Ile Asn Ile Thr Pro
            180                 185                 190

Leu Ala Arg Leu Ser Ala Thr Val Pro Asn Thr Ile Val Val Asn Trp
        195                 200                 205

Ser Ser Glu Phe Gly Arg Asn Tyr Ser Leu Ser Val Tyr Leu Val Arg
    210                 215                 220

Gln Leu Thr Ala Gly Thr Leu Leu Gln Lys Leu Arg Ala Lys Gly Ile
225                 230                 235                 240

Arg Asn Pro Asp His Ser Arg Ala Leu Ile Lys Glu Lys Leu Thr Ala
                245                 250                 255

Asp Pro Asp Ser Glu Val Ala Thr Thr Ser Leu Arg Val Ser Leu Met
            260                 265                 270

Cys Pro Leu Gly Lys Met Arg Leu Thr Val Pro Cys Arg Ala Leu Thr
        275                 280                 285

Cys Ala His Leu Gln Ser Phe Asp Ala Ala Leu Tyr Leu Gln Met Asn
    290                 295                 300

Glu Lys Lys Pro Thr Trp Thr Cys Pro Val Cys Asp Lys Lys Ala Pro
305                 310                 315                 320
```

```
Tyr Glu Ser Leu Ile Ile Asp Gly Leu Phe Met Glu Ile Leu Xaa Ser
                325                 330                 335

Cys Ser Asp Cys Asp Glu Ile Gln Phe Met Glu Asp Gly Ser Trp Cys
            340                 345                 350

Pro Met Lys Pro Lys Lys Glu Ala Ser Glu Val Cys Pro Pro Pro Gly
        355                 360                 365

Tyr Gly Leu Asp Gly Leu Gln Tyr Ser Pro Val Gln Xaa Gly Xaa Pro
    370                 375                 380

Ser Glu Asn Lys Lys Xaa Val Glu Val Ile Asp Leu Thr Ile Glu Ser
385                 390                 395                 400

Ser Ser Asp Glu Glu Asp Leu Pro Pro Thr Lys Lys His Cys Xaa Val
                405                 410                 415

Thr Ser Ala Ala Ile Pro Ala Leu Pro Gly Ser Lys Gly Xaa Leu Thr
            420                 425                 430

Ser Gly His Gln Pro Ser Ser Val Leu Arg Ser Pro Ala Met Gly Thr
        435                 440                 445

Leu Gly Xaa Asp Phe Leu Ser Ser Leu Pro Leu His Glu Tyr Pro Pro
    450                 455                 460

Ala Phe Pro Leu Gly Ala Asp Ile Gln Gly Leu Asp Leu Phe Ser Phe
465                 470                 475                 480

Leu Gln Thr Glu Ser Gln His Tyr Xaa Pro Ser Val Ile Thr Ser Leu
                485                 490                 495

Asp Glu Gln Asp Xaa Leu Gly His Phe Phe Gln Xaa Arg Gly Thr Pro
            500                 505                 510

Xaa His Phe Leu Gly Pro Leu Ala Pro Thr Leu Gly Ser Ser His Xaa
        515                 520                 525

Ser Ala Thr Pro Ala Pro Xaa Pro Gly Arg Val Ser Ser Ile Val Ala
    530                 535                 540

Pro Gly Xaa Xaa Leu Arg Glu Gly His Gly Gly Pro Leu Pro Ser Gly
545                 550                 555                 560

Pro Ser Leu Thr Gly Cys Arg Ser Asp Ile Xaa Ser Leu Asp
                565                 570
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<210> 7
<211> 99
<212> PRT
<213> Rattus norvegicus

<400> 7

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Thr Trp Thr Cys Pro Val Cys Asp Lys Lys Ala Pro Tyr Glu Ser Leu
1               5                  10                  15

Ile Ile Asp Gly Leu Phe Met Glu Ile Leu Asn Ser Cys Ser Asp Cys
            20                  25                  30

Asp Glu Ile Gln Phe Met Glu Asp Gly Ser Trp Cys Pro Met Lys Pro
        35                  40                  45

Lys Lys Glu Ala Ser Glu Val Cys Pro Pro Pro Gly Tyr Gly Leu Asp
    50                  55                  60

Gly Leu Gln Tyr Ser Pro Val Gln Glu Gly Asn Gln Ser Glu Asn Lys
65                  70                  75                  80

Lys Arg Val Glu Val Ile Asp Leu Thr Ile Glu Ser Ser Ser Asp Glu
                85                  90                  95

Glu Asp Leu
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<210> 8
<211> 167
<212> PRT
<213> Homo sapiens

<400> 8

```
Pro Pro Thr Lys Lys His Cys Ser Val Thr Ser Ala Ala Ile Pro Ala
1               5                  10                  15

Leu Pro Gly Ser Lys Gly Val Leu Thr Ser Gly His Gln Pro Ser Ser
            20                  25                  30

Val Leu Arg Ser Pro Ala Met Gly Thr Leu Gly Gly Asp Phe Leu Ser
        35                  40                  45

Ser Leu Pro Leu His Glu Tyr Pro Pro Ala Phe Pro Leu Gly Ala Asp
    50                  55                  60

Ile Gln Gly Leu Asp Leu Phe Ser Phe Leu Gln Thr Glu Ser Gln His
65                  70                  75                  80
```

```
Tyr Gly Pro Ser Val Ile Thr Ser Leu Asp Glu Gln Asp Ala Leu Gly
                85                  90                  95

His Phe Phe Gln Tyr Arg Gly Thr Pro Ser His Phe Leu Gly Pro Leu
            100                 105                 110

Ala Pro Thr Leu Gly Ser Ser His Cys Ser Ala Thr Pro Ala Pro Pro
        115                 120                 125

Pro Gly Ala Val Ser Ser Ile Val Ala Pro Gly Gly Ala Leu Arg Glu
    130                 135                 140

Gly His Gly Gly Pro Leu Pro Ser Gly Pro Ser Leu Thr Gly Cys Arg
145                 150                 155                 160

Ser Asp Ile Ile Ser Leu Asp
                165
```

<210> 9
<211> 167
<212> PRT
<213> Rattus norvegicus

<400> 9

```
Pro Pro Thr Lys Lys His Cys Pro Val Thr Ser Ala Ala Ile Pro Ala
1               5                   10                  15

Leu Pro Gly Ser Lys Gly Ala Leu Thr Ser Gly His Gln Pro Ser Ser
            20                  25                  30

Val Leu Arg Ser Pro Ala Met Gly Thr Leu Gly Ser Asp Phe Leu Ser
        35                  40                  45

Ser Leu Pro Leu His Glu Tyr Pro Pro Ala Phe Pro Leu Gly Ala Asp
    50                  55                  60

Ile Gln Gly Leu Asp Leu Phe Ser Phe Leu Gln Thr Glu Ser Gln His
65                  70                  75                  80

Tyr Ser Pro Ser Val Ile Thr Ser Leu Asp Glu Gln Asp Thr Leu Gly
                85                  90                  95

His Phe Phe Gln Phe Arg Gly Thr Pro Pro His Phe Leu Gly Pro Leu
            100                 105                 110

Ala Pro Thr Leu Gly Ser Ser His Arg Ser Ala Thr Pro Ala Pro Ala
        115                 120                 125
```

Pro Gly Arg Val Ser Ser Ile Val Ala Pro Gly Ser Ser Leu Arg Glu
130 135 140

Gly His Gly Gly Pro Leu Pro Ser Gly Pro Ser Leu Thr Gly Cys Arg
145 150 155 160

Ser Asp Val Ile Ser Leu Asp
165

<210> 10
<211> 98
<212> PRT
<213> synthetic construct

<220>
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<222> (26)..(26)
<223> Xaa = serine or asparagine

<220>
<221> misc_feature
<222> (72)..(72)
<223> Xaa = glycine or glutamic acid

<220>
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<222> (74)..(74)
<223> Xaa = aspartic acid or asparagine

<220>
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<223> Xaa = proline or glutamine

<220>
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<223> Xaa = lysine or arginine

<400> 10

Trp Thr Cys Pro Val Cys Asp Lys Lys Ala Pro Tyr Glu Ser Leu Ile
1 5 10 15

Ile Asp Gly Leu Phe Met Glu Ile Leu Xaa Ser Cys Ser Asp Cys Asp
20 25 30

Glu Ile Gln Phe Met Glu Asp Gly Ser Trp Cys Pro Met Lys Pro Lys
35 40 45

Lys Glu Ala Ser Glu Val Cys Pro Pro Pro Gly Tyr Gly Leu Asp Gly

50 55 60

Leu Gln Tyr Ser Pro Val Gln Xaa Gly Xaa Xaa Ser Glu Asn Lys Lys
65 70 75 80

Xaa Val Glu Val Ile Asp Leu Thr Ile Glu Ser Ser Ser Asp Glu Glu
85 90 95

Asp Leu

<210> 11
<211> 167
<212> PRT
<213> Synthetic construct

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<223> Xaa = serine or proline

<220>
<221> misc_feature
<222> (23)..(23)
<223> Xaa = valine or alanine

<220>
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<222> (44)..(44)
<223> Xaa = glycine or serine

<220>
<221> misc_feature
<222> (82)..(82)
<223> Xaa = glycine or serine

<220>
<221> misc_feature
<222> (94)..(94)
<223> Xaa = alanine or threonine

<220>
<221> misc_feature
<222> (101)..(101)
<223> Xaa = tyrosine or phenylalanine

<220>
<221> misc_feature
<222> (106)..(106)
<223> Xaa = serine or proline

<220>

<221> misc_feature
<222> (121)..(121)
<223> Xaa = cysteine or alanine

<220>
<221> misc_feature
<222> (128)..(128)
<223> Xaa = proline or alanine

<220>
<221> misc_feature
<222> (140)..(140)
<223> Xaa = glycine or serine

<220>
<221> misc_feature
<222> (141)..(141)
<223> Xaa = alanine or serine

<220>
<221> misc_feature
<222> (164)..(164)
<223> Xaa = isoleucine or valine

<400> 11

```
Pro Pro Thr Lys Lys His Cys Xaa Val Thr Ser Ala Ala Ile Pro Ala
1               5                   10                  15

Leu Pro Gly Ser Lys Gly Xaa Leu Thr Ser Gly His Gln Pro Ser Ser
            20                  25                  30

Val Leu Arg Ser Pro Ala Met Gly Thr Leu Gly Xaa Asp Phe Leu Ser
        35                  40                  45

Ser Leu Pro Leu His Glu Tyr Pro Pro Ala Phe Pro Leu Gly Ala Asp
    50                  55                  60

Ile Gln Gly Leu Asp Leu Phe Ser Phe Leu Gln Thr Glu Ser Gln His
65                  70                  75                  80

Tyr Xaa Pro Ser Val Ile Thr Ser Leu Asp Glu Gln Asp Xaa Leu Gly
                85                  90                  95

His Phe Phe Gln Xaa Arg Gly Thr Pro Xaa His Phe Leu Gly Pro Leu
            100                 105                 110

Ala Pro Thr Leu Gly Ser Ser His Xaa Ser Ala Thr Pro Ala Pro Xaa
        115                 120                 125
```

Pro Gly Arg Val Ser Ser Ile Val Ala Pro Gly Xaa Xaa Leu Arg Glu
130 135 140

Gly His Gly Gly Pro Leu Pro Ser Gly Pro Ser Leu Thr Gly Cys Arg
145 150 155 160

Ser Asp Ile Xaa Ser Leu Asp
165

<210> 12
<211> 26
<212> PRT
<213> Synthetic construct

<400> 12

Ala Thr Gly Ala Ala Gly Ala Thr Cys Ala Ala Ala Gly Ala Gly Cys
1 5 10 15

Thr Thr Thr Ala Cys Cys Gly Ala Cys Gly
20 25

<210> 13
<211> 23
<212> PRT
<213> Synthetic construct

<400> 13

Thr Cys Ala Gly Thr Cys Cys Ala Gly Gly Gly Ala Ala Ala Thr Cys
1 5 10 15

Ala Thr Gly Ala Cys Cys Gly
20